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by the present mode of treatment until the country is base-leveled; that the SzeChuanese have thus demonstrated one mode of effective secular maintenance of the soil productivity; that their method is closely analogous to the natural method of the geologic ages; that a Chinese expert would criticize western practice as influenced unduly by prejudice respecting the use of the katamorphic products of human food-consumption.

That notwithstanding the loss due to this prejudice respecting the use of human katamorphic products, the soils of western nations generally show increases of productivity in the later years compared with the earlier; that, in particular, the data furnished by the Bureau of Statistics and the Bureau of Soils that the productivity of the soils of the United Kingdom, France, Belgium, Netherlands, Denmark, Germany, Austria, Hungary, Roumania and Russia show rather steady and notable increases in productivity for the last two or more decades that are covered by the statistics; that the lands most densely inhabited and most intensively cultivated, such as those of England, France, Germany and neighboring states, are more productive, unit for unit, than those of Russia, which are less densely occupied and less closely and persistently cultivated; that the old soils of Europe are more productive, unit for unit, than the newer soils of America; that in the United States the productivity of the last forty years shows general increase per acre; that the increase per acre in the older states, as the New York-New England group or the middle states, is more marked than in the southern or in the western groups, notwithstanding the larger proportion of virgin soil recently brought under cultivation in the last group; that while these and all similar statistics are subject to many qualifications in interpretation and application, they do not offer substantial grounds for an alarming forecast, applicable to an industrious and intelligent people willing to be guided either by oriental experience or by western scientific research.

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#### NOTES ON METEOROLOGY AND CLIMATOLOGY

THE effect of the recent construction of high buildings in New York City upon the United States Weather Bureau's records of wind velocity and direction for that city are discussed by Mr. E. S. Nichols, the local forecaster, in the October number of the *Monthly Weather Review*. Since the anemometer and the windvane were placed upon the American Surety Building at an altitude of 350 feet above the street in 1900, several new "skyscrapers" have been erected in the immediate vicinity, vitiating to a greater or less extent the wind records since obtained. A comparison of the bureau's records with those of the New York Meteorological Observatory in Central Park, where the environment has not been greatly changed in forty years, shows that there has been a decrease of 16 per cent. in the hourly wind movement directly attributable to the recent construction. North winds have been affected the most; northeast and east have not been changed materially; while other directions have been considerably reduced. The number of days upon which gales have been recorded has decreased noticeably, and wind direction has been more or less deflected. Partly because of a desire to prevent the recurrence of such a condition in other cities, the bureau is gradually erecting appropriate buildings of its own in localities where future changes in the environment are not likely to affect the records obtained.

FROM an investigation of the relation between solar activity and terrestrial temperatures, Professor Humphreys has come to the conclusion that the decrease in the ultra-violet radiations received by the earth during the period of sun-spot maximum causes a similar decrease in the amount of ozone formed in the upper part of the earth's atmosphere. Moreover, since ozone allows the solar heat rays to penetrate it freely but absorbs most of the returning earth reflection, spot maxima indirectly produce diminished terrestrial temperatures. Abbot and Fowle had already concluded that spot maxima are accompanied by terrestrial temperature minima, and *vice*

*versa*, but had not recognized the significance of ozone in the sequence of events. The revival of scientific interest in ozone dates from 1904, when the late Professor Angström showed that a large amount of it existed in the upper atmosphere. As much may be gained from a further study, the chief of the Weather Bureau has urged the International Meteorological Committee to investigate the problem.

THE latest publication of the English Solar Physics Committee, "Southern Hemisphere Surface-air Circulation," was prepared by Dr. William J. S. Lockyer, secretary of the Solar Commission of the International Meteorological Committee. The work consists of a study of the mean monthly pressure amplitudes, the tracks of the cyclones and anticyclones and the meteorological records of several Antarctic expeditions. In an earlier memoir Dr. Lockyer pointed out the apparent similarity of the air movements over Australia, South Africa and South America, and suggested that anticyclones which crossed Australia were indications of a continuous state of things occurring in a belt encircling the earth. In the present memoir he shows the presence of such a belt in which movement is from west to east. The survey, which is an extensive one, doubtless will aid in the attempt to associate solar activity with the air movements of the southern hemisphere. Moreover, it also suggests that greater importance, from this point of view, must be attached to the meteorology of the polar regions than has hitherto been the case.

FROM a study of simultaneous records made at Corona, Colo., altitude 11,660 feet, and Denver, Colo., altitude 5,347 feet, distant in an air line about 38 miles, Professor A. J. Henry arrives at conclusions which briefly stated are as follows: (1) In general the temperature changes at high and low level stations are nearly synchronous, in point of time, and similarly directed. (2) Any abnormal course of the temperature between a mountain station and a near-by low-level station can generally be explained by considering the pressure distribution over the surrounding regions to a distance of at least 1,000 miles

from the station. (3) An inversion of temperature between Corona and Denver occurs most frequently when the latter is under the influence of a Montana anticyclone while the former is affected by a cyclone to the west. (4) The high southwest and west winds occasionally observed on Pikes Peak and Corona indicate the early formation of a cyclone to the northwest or north. (5) In winter, mountain temperatures fall whenever a cyclone passes eastward across the mountains, or southeastward from Montana to Kansas. (6) The temporary presence of an anticyclone in the Great Basin affects the winds upon the mountains of central Colorado, giving high temperatures and fair weather. (7) The latter mountains cause a slight lowering of the pressure in an anticyclone as it passes over them.

ACCORDING to the Bulletin of the Mount Weather Observatory issued by the Weather Bureau October 31, 1910, during the three years in which regular free-air observations have been made the kite flights over 5,000 meters above sea-level number 31. Of these, three are over 7,000 meters, while in six of the flights the kites flew at a greater altitude above sea-level than has been attained elsewhere. The flight of 6,440 meters made April 5, 1910, at the Royal Aeronautical Observatory, Lindenberg, Germany, is the seventh highest above sea-level. In the opinion of Dr. William R. Blair, who has charge of the aerial work, the kite-flying apparatus has usually been the limiting factor at Mount Weather, and as this is gradually being improved, he expects that the kites will attain still greater heights. The upper air data are not only used by the forecasters in the central office in Washington, but it is hoped that when interpreted they will add to our knowledge of the atmosphere as a whole. Owing to the nearness of the ocean sounding balloons are not liberated on Mount Weather, but they have been sent up periodically from Indianapolis, Ind., Fort Omaha, Neb., and Huron, S. D. As these experiments have resulted in the acquirement of very desirable data, it is probable that they will be continued and perhaps extended during the present year.

A PRELIMINARY report of the investigation of the upper air in Java has recently been made by Dr. W. van Bemmelen and Dr. C. Braak. Aerological investigation at the Batavia observatory was begun under the auspices of the Dutch government in 1909. Because of the proximity of the sea, pilot balloons only were used at first, and with these a more thorough knowledge of the upper currents was obtained. Later recording instruments were elevated by means of captive balloons and kites, the latter being used above the sea as well as above the land. It was found that during the period September-May the general air-current had easterly components up to the greatest heights attained (10-15 kilometers), though occasionally the west monsoon appeared at the ground, its average height having been found to be 5.4 kilometers. No antitrade wind aloft was found. However, on one occasion when a balloon attained a height of 18 kilometers it encountered a westerly wind, similar to the strong westerly winds which were observed at heights of 10-20 kilometers on Professor Berson's East-African expedition. This phenomenon still awaits an explanation.

THE newly created professorship in meteorology at the National University at Utrecht has been awarded to Dr. E. van Everdingen, who assumed the chair October 17. Considering the recent history of meteorology, the inaugural address, "The Third Dimension in Meteorology," was particularly appropriate. In Dr. Everdingen's estimation, the setting apart of a chair of meteorology indicated a recognition that meteorology was now worthy of a place among the established sciences.

As a result of many requests from teachers, students and others interested in the subject, the Weather Bureau has published a second compilation of standard books dealing with meteorology and its several branches. The list includes about 150 titles, the selections having been made by Mr. C. Fitzhugh Talman, librarian of the bureau. As stated in the introduction, "the present compilation is the fruit of several years' experience in dealing with the literature of the subject, and will

probably meet the requirements of the majority of American readers and students."

THE action of the management of the recent International Aviation Meet at Belmont Park in taking out insurance against loss due to inclement weather is one of the first instances of its kind in America. The practise is a common one in Europe, however, especially so in England, where managers of most of the outdoor gatherings have long insured through Lloyd's against loss from wet weather. The premiums paid for the risks were relatively large at first, but of late there has been a tendency toward placing the practise upon a scientific basis, statistics having been gathered with that end in view, and in consequence the rates have been readjusted.

ANDREW H. PALMER

BLUE HILL OBSERVATORY,

January 14, 1911

#### SPECIAL ARTICLES

##### INTERPRETATIONS OF RESULTS NOTED IN EXPERIMENTS UPON CEREAL CROPPING METHODS AFTER SOIL STERILIZATION<sup>1</sup>

IT is not my intention at this time to give the details of extended experiments upon soil sterilization and its effects; nor to enter any special criticisms upon the work of other investigators. I wish only to call attention to some facts, observations and conditions of the work centered about cereal cropping and experiments upon soils which may indicate that a new light may be thrown upon the conclusions to be drawn; with that light emanating from a different source than has usually been indicated by most experimenters.

*Observations and Reflections.*—The following features of cropping and experiments will be familiarly known to most of you:

1. New Lands, when first sown to wheat or other cereals, produce quite lavishly in seed of high quality and at slight effort on the part of the farmer. These new land yields, in this country, are quite commonly taken as the standard of what ought to be expected.

<sup>1</sup> Read before the Society of Agronomy, Washington, D. C., November meeting, 1910.